

## At Greenwich on June 21

Sun rises, 3h. 45m.; souths, 12h. 1m. 30's.; sets, 20h. 18m.; decl. on meridian, 23° 27' N.; Sidereal Time at Sunset, 14h. 19m.

Moon (Full on June 27, 11h.) rises, 14h. 14m.; souths, 19h. 44m.; sets, 1h. 5m.\*; decl. on meridian, 8° 24' S.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury ...	3 12 ...	11 29 ...	19 46 ...	23 33 N.
Venus ...	4 38 ...	12 58 ...	21 18 ...	23 51 N.
Mars ...	2 4 ...	10 0 ...	17 56 ...	20 26 N.
Jupiter ...	9 6 ...	16 13 ...	23 20 ...	12 9 N.
Saturn ...	3 43 ...	11 52 ...	20 2 ...	22 30 N.

\* Indicates that the setting is that of the following day.

## Phenomena of Jupiter's Satellites

June	h. m.		June	h. m.	
21 ...	21 9	I. occ. disap.	25 ...	22 30	III. ecl. reap.
22 ...	20 47	I. tr. egr.	27 ...	20 23	I. tr. ing.

The Phenomena of Jupiter's Satellites are such as are visible at Greenwich

June	h.	
21 ...	—	Sun at greatest declination north; longest day in northern latitude.
24 ...	8	Mercury at least distance from the Sun.
26 ...	20	Venus at least distance from the Sun.
27 ...	15	Mercury in superior conjunction with the Sun.

## GEOGRAPHICAL NOTES

THE last issue of the *Izvestia* of the Russian Geographical Society (xx., 6) contains an interesting paper, by M. Kosyakoff, topographer, who accompanied, in 1882, Dr. Regel during his journey through Karategin and Darvaz. The paper deals almost exclusively with the topography of the explored region, and thus gives a plain description of the explored routes, containing the necessary topographical data for forming an opinion on the much-debated questions as to the orography of that part of the Pamir region. A route-map, on the scale of ten miles to an inch, accompanies the paper. Starting from Penjkent, M. Kosyakoff soon reached the 9800 feet high lake, Kouli-kalam. Then he crossed the 12,000 feet high and snow-covered Badkhan Mountains which separate the Zarafshan from the upper Sirkhab, tributary of the Fan, and continuing to make his way amidst deep and rocky mountain-gorges, he soon reached the lake, Iskander-kul, 7120 feet above the sea-level. Thence, crossing the Mura Pass, richly clothed with vegetation on its northern slope, the expedition descended to Karatag and Hissar, and, by a route quite suitable for carriages, they proceeded further to Kabadian. A good route along the Waksh River brought Dr. Regel and his travelling companions to Kurgan-tube; but, to reach Koulab, they had to cross the Tash-robot Pass, all covered from top to foot with pistach trees. From Koulab, which is more animated than Kabadian, the expedition went to the rich Mumin-abad Valley, peopled with Tadjiks agriculturists; thence to the twenty-five villages of the Dara district, and, continuing their journey north-east on the right bank of the Pendj, they soon reached Kala-i-khumb. The Pendj River being there but thirty-five miles distant from Tavil-dara on the Waksh, the expedition went there before proceeding further up the Pendj, and followed the upper Waksh in a north-east direction for some fifty-five miles. From Kala-i-khumb, M. Kosyakoff made a further very interesting excursion up the Pendj and its tributary, the Vantch, up to its source, whence he was compelled by a fever to return to Kala-i-khumb and thence to Samarcand. The map published by the *Izvestia* contains, moreover, the very interesting route from Tavil-dara to Bal-juan, and thence to Hissar, and further west to Baisoun, Anar-bulak, and Yar-tube.

AMONG the works announced for this year by the Russian Geographical Society we see the last fascicule of the valuable "Geographical and Statistical Dictionary of Russia;" the atlas of maps to accompany Baron Kaulbars' work on the delta of the Amu-Daria; a geognostic map of the shores of Lake Baikal, by M. Chersky; the work of Dr. Sperck on the Amur region; and a work by M. de Vollen on the songs of Ugrian Russians. There is promised, also, the long-expected results of the great survey of Siberia, from the Ural Mountains to Lake Baikal, accomplished in 1874. The commander of the expedition having died since, the work had to be given for calculations to other persons;

but now the name of M. Tillo, who has undertaken its publication, is a guarantee that this capital work will not be lost to science.

DR. FISCHER, of the University of Marburg, the author of a monograph on the climate of Mediterranean countries, read a paper before a recent meeting of the Verein für Erdkunde at Halle on the morphology of the coasts of the Mediterranean, which is reprinted in the *Hallische Zeitung*. "The Mediterranean," he said, "was specially important for some investigations into physical geography, for it has been the theatre of a long history, and we have therefore information about its coasts extending over many centuries. Although it washes the shores of three continents, this sea exhibits a striking similarity in its fauna and flora everywhere. It must, therefore, in its present form, belong to one of the most recent geological periods, even though particular basins may be much older. It owes its origin to great movements in the crust of the earth, and the form of its coasts is attributable to the same cause, modified by more recent influences. In the present coast formation in the north-western basin, two different types are perceptible, which may most conveniently be designated as the North Sicilian and the Languedoc types. If we follow the coast of Italy from Naples, then the Sicilian and North African coasts around to the Straits of Gibraltar, we meet with twenty-two smaller bays having the form of a semicircle. Their sizes do not vary greatly, the chord of the smallest being 15 km., that of the largest 65, and that of the great majority between 30 and 35 kms. Over this extent the coasts are almost everywhere precipitous, and a short distance from the shore the sea deepens rapidly. How has this formation arisen?" Quoting Suess's "Das Antlitz der Erde," Dr. Fischer said, "there appeared to be all along this coast a great fissure in the crust of the earth. The formation of the Apennines, the Atlas and the occurrence of volcanic phenomena along the whole line would point to this. But this would not account for the bays here mentioned; many of these are probably due to the sea washing away the softer from amongst the harder rocks. The projecting headlands are hard, old, crystalline rocks, while inside are the newer and softer kinds. These inlets, too, are not found everywhere along the coast, but only where the harder rocks are present. That the coasts here are greatly exposed to denudation by the action of the waves is shown by the numerous caves and cliffs, and the violent surge which beats against the vast harbour-works of the French on the coast of Algeria. The prevailing winds there are north and north-east, and thus assist the waves. Another factor is the current, which flows eastwards along the north coast of Africa from the Straits of Gibraltar. This meets the projecting capes and headlands, which deflect part of it into the bays, creating in the latter a counter-current which acts as a scour, keeping the bottom free from alluvium, and also exercising its influence on the semi-circular formation of the inlets. The Bay of Tunis is an exception. This is much deeper than the others, and the currents cannot therefore exercise the same influence over it. The alluvium is deposited, the River Medjerda brings down its contribution, and the result is a constant formation of land there. This bay belongs rather, on this account, to the second type, existing on the Mediterranean coasts of Northern Italy and Languedoc. The Tuscan coast was originally similar to that of Lower Italy, but it has now been altered beyond recognition. Here, to the west of the Apennines, there is a wide district with easily-denuded rocks. The rivers, especially since man has so disafforested the region, bring down vast quantities of alluvium. The current which flows into the Tyrrhenian Sea is deflected northward along the coast, and causes the deposit of the alluvium inshore, so that the ancient bays are gradually silting up. In ancient times the shores of this now harbourless sea had numerous bays, and Tyrrhenians were skilful navigators. At the mouth of the Arno the operation is best seen. Pisa, which was founded as the port on the sea at the mouth of the river, was no longer on the coast in Strabo's time, and is now some distance inland. The land-formation on the coasts of Languedoc is even more striking. In former times there were steep shores, protected by a row of islands, behind which lay a calm inland sea, on which the city of Narbonne was built. The sea silted up from inside and out—from inside by the rivers, from outside by the currents created by the frequent south-east winds which conveyed the alluvium of the eastern rivers, especially the Rhone, and deposited it there. The islands became joined to the land, and the inland sea disappeared. Thus arose on these coasts the flat plains, behind which are small lakes and marshes.

AT the meeting of the Paris Geographical Society of May 22 further information was read respecting the expedition of M. Teisserenc de Bort to explore the Sahara. Leaving Tuggurt, they marched south-south-west to Hassi Ouled Miloud, the last point visited by the Flatters mission. Thence, passing through Bereçoff, they ultimately reached Gabas. Near Ghourd-Roued M. de Bort found well-marked traces of an old lake of sweet water, about a kilometre long, and 700 or 800 m. wide. In the depression thus created there were evidences of a prehistoric station in numerous flint arrow-heads, and from this point to Gabas the presence of man at a very ancient epoch was attested by chipped flints.—M. de Quatrefages read a paper on the Red Indians, and on the half-breeds of the United States and Canada. The position which the writer maintains is that the Indians do not diminish so rapidly as is generally believed, as, for example, the Maoris. The half-castes are put in the census as whites; Indian women married to whites are similarly counted. "Placed in favourable conditions, the Red-skins, far from diminishing in number, have increased, and are increasing. But they have not preserved their ethnic purity. Mixture with white blood has taken place even in the most remote tribes, and perhaps now the number of natives of pure blood is insignificant everywhere; but, on the other hand, the blood of the natives is mixing more and more with that of the whites, and the latter accept more easily day by day the half-breed as one of themselves." Although the Red Indians are disappearing as such, they will still live in the future true Anglo-American race. M. Henri Condreau gave a succinct account of six journeys which he made between 1881 and 1885 in Guiana. The writer is Professor at the Lycée at Cayenne, and performed two of these journeys during vacations; the others were undertaken at the request of the Governor of French Guiana. The most important one was from Manaos through the whole of Central Guiana, between the Rio Negro and Cayenne. He had already performed two-thirds of his task, and passed the sources of the Trombette, when he lost all his articles for barter amongst the Indians, and was deserted by his followers. During four months he was alone amongst savages, ultimately arriving at his destination by a forced march of thirty days through the virgin forest.

BEFORE the Society of Commercial Geography in Paris, M. Andreau described the prairies of Guiana which he traversed in his journey between the Rio Negro and Cayenne. Behind the enormous forests which extend inland from the coasts he found prairies wholly devoid of trees, where the air was dry and the climate mild. He strongly advocated the establishment of agricultural colonies there, describing the climate as in all respects the reverse of that found on the coast.

THE well-known African traveller, Major Serpa Pinto, is stated to have discovered large coal-fields south of the Rovuma River. The Rovuma is a coast river, and its estuary is situated about 11° S. lat. Along its banks runs the ancient caravan route from Cape Delgado to Lake Nyassa. The coal-fields were first claimed by the Sultan of Zanzibar, but have now been taken possession of by the Portuguese Government.

A SCIENTIFIC expedition under the charge of Lieut. Hovgaard, of the Danish Navy, is being prepared to investigate the eastern coasts of Greenland. M. Gamel, the owner of the vessel, has put it at M. Hovgaard's disposal, and the Danish Government will pay the cost of the expedition.

M. HANSEN-BLANGSTED has reported to the Geographical Society of Paris that the first steamer coming directly from the open sea arrived at Cologne on March 18. It is called the *Industry*, belongs to a company of Mannheim, and is of 513 tons burden. "This is an event important not only for Cologne, but also for every town on the Rhine."

PROF. KARL GOTTSCHÉ, of the University of Kiel, has just returned from his travels in Eastern Asia. After having lectured on Mineralogy and Geology for several years at Tokio, he undertook a scientific exploring expedition in Korea, at the request of the Korean Government, which lasted until December, 1884. His route extended over 3000 kilometres. Dr. Gottsché intends shortly to publish his geological, mineralogical, and ethnographical investigations of Korea. To our knowledge this is the first scientific investigation of the great East-Asiatic peninsula.

DR. H. Z. C. TEN KATE departed on May 18 from Southampton. He goes to the interior of Surinam, where he intends to devote himself to anthropological and ethnological studies.

A grant has been given to him by Dr. Riebeck (Halle a/S) and Prince Roland Bonaparte.

A TELEGRAM dated "near Herat, June 9," states that, pending the settlement of the frontier question, the Frontier Commission is exploring and mapping out the country in all directions.

### ON THE MESOZOIC FLORAS OF THE ROCKY MOUNTAIN REGION OF CANADA<sup>1</sup>

IN a previous memoir, published in the *Transactions* of the Royal Society of Canada, vol. i., the author had noticed a lower cretaceous flora consisting wholly of pines and cycads occurring in the Queen Charlotte Islands, and had described a dicotyledonous flora of Middle Cretaceous age from the country adjacent to the Peace River, and also the rich Upper Cretaceous flora of the coal formation of Vancouver's Island—comparing these with the flora of the Laramie series of the North-West Territory, which he believed to constitute a transition group connecting the Upper Cretaceous with the Eocene Tertiary.

The present paper referred more particularly to a remarkable Jurassic-Cretaceous flora recently discovered by Dr. G. M. Dawson in the Rocky Mountains, and to intermediate groups of plants between this and the Middle Cretaceous, serving to extend greatly our knowledge of the Lower Cretaceous flora and to render more complete the series of plants between this and the Laramie.

The oldest of these floras is found in beds which it is proposed to call the Kootanie group, from a tribe of Indians of that name who hunted over that part of the Rocky Mountains between the 49th and 52nd parallels. Plants of this age have been found on the branches of the Old Man River, on the Martin Creek, at Coal Creek, and at one locality far to the north-west on the Suskwa River. The containing rocks are sandstones, shales, and conglomerates, with seams of coal, in some places anthracitic. They may be traced for 140 miles in a north and south direction and form troughs included in the Palæozoic formations of the mountains. The plants found are conifers, cycads, and ferns, the cycads being especially abundant and belonging to the genera *Dioonites*, *Zamites*, *Podozamites*, and *Anomozamites*. Some of these cycadaceous plants, as well as of the conifers, are identical with species described by Heer from the Jurassic of Siberia, while others occur in the Lower Cretaceous of Greenland. The almost world-wide *Podozamites lanceolatus* is very characteristic, and there are leaves of *Salisburya sibirica*, a Siberian Mesozoic species, and branches of *Sequoia smittiana*, a species characteristic of the Lower Cretaceous of Greenland. No dicotyledonous leaves have been found in these beds, whose plants connect in a remarkable way the extinct floras of Asia and America and those of the Jurassic and Cretaceous periods.

Above these are beds which, with some of the previous species, contain a few dicotyledonous leaves, which may be provisionally referred to the genera *Stercula* and *Laurus*; and still higher the formation abounds in remains of dicotyledonous plants, of which additional collections have been made by Mr. T. C. Weston. The beds containing these, though probably divisible into two groups, may be named the Mill Creek series, and are approximately on the horizon of the Dakota group of the United States geologists, as illustrated by Lesquereux and others. The species are described in the paper, and differ for the most part from those of the Dunvegan group of the Peace River series, which is probably of the age of the Niobrara group, and, of course, still more from the overlying Laramie group. With regard to the latter, the author adduced some new facts confirmatory of his previously expressed view as to the position of the Laramie at the top of the Cretaceous and base of the Eocene, and also tending to show that some of the plants still held by certain palæo-botanists to be of Miocene age are really, in Canada at least, fossils of the Laramie group, and consequently considerably older than is currently supposed. The collections of plants studied by the author had for the most part been placed at his disposal by the Director of the Geological Survey.

### HYDROMECHANICS

THE last of the series of lectures at the Institution of Civil Engineers during the session of 1884-85 on "The Theory and Practice of Hydromechanics," was delivered on Thursday

<sup>1</sup> Read before the Royal Society of Canada, May, 1885, by Sir William Dawson, C.M.G., LL.D., F.R.S.